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USPT,JPAB,EPAB,DWPI,TDBD	galactose or lactose	69357	L1

L15: Entry 99 of 133 File: USPT Apr 21, 1992

DOCUMENT-IDENTIFIER: US 5106967 A
TITLE: Functional sugar substitutes with reduced calories

BSPR:
Most artificial sweeteners in use today have a greater relative sweetness than sucrose; thus, relatively small quantities are required to deliver the desired sweetness. Such low volume sweeteners may be acceptable for certain applications (e.g., beverages), however, they do not provide sufficient bulk and functionality for use in solid and semi-solid foods like baked goods and frozen desserts. In fact, even high intensity sweetener-containing beverages have a detectable reduction in their body. Two avenues have been explored to overcome this bulking problem:

BSPR:
U.S. Pat. No. 4,459,316, Bakal, issued July 10, 1984, teaches that di- and trisaccharides containing one levohexose component and at least one dextrohexose component (e.g., .alpha.-L-glucopyranosyl-D-fructofuranose) are non-caloric. These disaccharides are costly to synthesize due to the fact that they are prepared from a racemic mixture of D-hexoses and expensive L-hexoses.

BSPR:
It has now been found, that carbohydrates in the 5-C-hydroxymethyl-hexose series can be effectively used as replacements for sugar, especially in baked goods. These carbohydrate derivatives provide sucrose-like functionality (i.e., bulk, texture and stability) with significantly reduced calories compared with sucrose. In addition, many of these carbohydrate derivatives are easier to synthesize than currently available functional sugar substitutes. It is believed that they are essentially free of the significant negative physiological effects (i.e., flatus and diarrhea) generally associated with such compounds. It has also been shown that saccharides containing a 5-C-hydroxymethyl-hexose component provide similar benefits. This also holds true for the alditols of these carbohydrates (e.g., 5-C-hydroxymethyl-hexitols, 5-C-hydroxymethyl-aldohexosyl polyol derivatives, alkyl derivatives (e.g., 5-C-hydroxymethyl-aldohexosyl glycerol and 5-C-hydroxymethyl-aldohexosyl-glucitol) of the carbohydrates (i.e., alkyl 5-C-hydroxymethyl-aldohexosides), and 1,6-anhydro-.beta.-L-, and 1,6-anhydro-.beta.-D derivatives of the pyranose compounds (i.e., the bicyclic tautomeric forms) and the related derivatives of the ketohexoses.

BSPR:
The invention further encompasses food compositions (e.g., beverages, baked goods, frozen deserts and candies) containing the above-mentioned novel carbohydrates or their alditols.

BSPR:
The term "baked goods" refers to all manner of foods which are cooked (i.e., prepared using heat). These baked goods include, but are not limited to, foods prepared using dry heat (i.e., a radiant or convection oven), fried foods, boiled foods and foods heated in a microwave oven.

BSPR:
The term "food compositions" refers to and includes all manner of viand (both

sweetened and un-sweetened foods) for usage by man or animal. These food stuffs include, but are not limited to, baked goods, salted snacks, other flavored snacks, fruit drinks/mixes, frozen foods, candies, carbonated beverages, milk drinks/mixes, gelatins, puddings, fillings, breakfast cereals, breakfast bars, sauces, jams, jellies, whipped toppings, tablets, syrups, orally administered medicines, spreads, chewing gums and chocolates.

BSPR:
The term "galactose oxidase" as used herein refers to D-galactose: oxygen 6-oxidoreductase which is identified as E.C. 1.1.3.9 or as Chemical Abstracts Registry Number 9028-79-9.

BSPR:
Novel food compositions of the present invention contain from about 1% to about 99% of any of the above-mentioned compounds. Preferred embodiments of these food compositions include baked goods, fruit drinks/mixes, frozen foods, candies, carbonated beverages, milk drinks/mixes, gelatins, puddings, fillings, breakfast cereals, breakfast bars, sauces, jams, jellies, whipped toppings, tablets, syrups, orally administered medicines, spreads, chewing gums and chocolates. The most preferred food compositions are baked goods.

DEPR:
The reaction is conducted in a one liter vessel equipped with an aerator and a gentle stirrer. Sterile conditions are used to prevent enzyme deactivation by microbial contamination. The reaction is run at 4.degree. C. to minimize deactivation of galactose oxidase.

DEPR:
Methyl .beta.-D-galactopyranoside (1) is dissolved in the aerated phosphate buffer. The volume flow of air discharged by the aerator is regulated to produce an oxygen saturated solution while preventing foaming of the solution. At 4.degree. C., the galactose oxidase and catalase are added and this solution is aerated for 20 hours.

DEPR:
The reaction is conducted in a vessel equipped with a gentle stirrer and an aerator. Sterile conditions are used to prevent enzyme deactivation by microbial contamination. The reaction is run at 4.degree. C. to minimize deactivation of galactose oxidase.

DEPR:
Lactitol (23) is dissolved in the aerated phosphate buffer. At 4.degree. C., the galactose oxidase and catalase are added and this solution is aerated to maintain oxygen saturation for 20 hours.

DEPR:
The ingredients are stirred with a large spoon until well blended (about 50 strokes or 1 minute) to form a batter. The batter is poured into a lightly greased 13".times.9".times.2" pan, and then baked at 350.degree. F. for about 26.5 minutes to produce the finished brownies.

DEPR:
The ingredients are combined and the resulting dough is kneaded until uniform. Dough balls (10-13 gm) are individually placed on a lightly greased cookie tray and then baked at 350.degree. F. for 7-8 minutes to produce finished cookies.

DEPR:
The ingredients are stirred with an electric mixer to form a uniform batter. The batter is poured into a lightly greased 13".times.9".times.2" pan, and then baked at 350.degree. F. for 40 minutes to produce the finished white cake. This cake looks and tastes like a conventional white cake, but has nearly no caloric value.

DEPC:

1. Oxidation of Methyl .beta.-D-Galactopyranoside with Galactose Oxidase

DETL:

##STR20## Reagents MW Moles Amount methyl .beta.-D- 194.18 0.103 20.0 g galactopyranoside Sigma Chemical Co., (No. M-6757) Phosphate Buffer, 100 mM -- -- 412.0 ml Catalase, 16900 units/mg -- -- 7.5 mg Sigma Chemical Co., (No. C-40) Galactose Oxidase -- -- 9000 units

DETL:

##STR31## ##STR32## Reagent Amount Lactitol (23) 20.0 g (manufactured by CCA BioChem) Phosphate Buffer, 100 mM, pH 7 232.0 ml Catalase (Sigma), 16900 u/mg 7.00 mg Galactose Oxidase 9000 units

DETL:

Ingredient Amount (gms)

5-C-hydroxymethyl-.alpha.-L-arabino-hexopyranosyl- 309.8 g D-glucitol (as prepared in Example IX) Flour 152 g Vegetable shortening 50 g Cocoa 35.3 g Starch 11.7 g Conventional additives (flavors and a small 6.2 g amount of baking soda) Eggs 50 g Oil 63 g Water 80 g

DETL:

Ingredients Amounts (gms) 1,6-anhydro-5-C-hydroxymethyl-.beta.-L-176 altropyranose (as prepared in Example II) Table Sugar (i.e., sucrose) 176 Flour 328 Shortening 196 Egg 96 Water 20 Conventional additives (flavors and a small 8 amount of baking soda)

DETL:

Ingredients Amount (gms)

5-C-hydroxymethyl-.alpha.-D-xylo-hexopyrano- 133 side (as prepared in Example V) Cake flour 107 Erythritol tetraester of olive oil 47.5 fatty acid (a polyol polyester used used as a shortening) Double-acting baking powder 6.7 Milk 130 Egg whites 60 Vanilla 2.5

URNM:
Bakal

L16: Entry 1 of 5 File: USPT May 6, 1997

DOCUMENT-IDENTIFIER: US 5626893 A
TITLE: Method of treating a divided cheese product for anticaking

DEPR:
This example investigates the addition of dried preparations of glucose oxidase, glucose oxidase/catalase, galactose oxidase, galactose oxidase/catalase in the anticaking agent to retard growth of yeast and molds. In the prior art, glucose oxidase enzyme was combined with glucose in cellulose based anticaking agents. It was anticipated that glucose oxidase enzyme could oxidize glucose to gluconic acid and hydrogen peroxide. In so doing, it could consume a portion of the oxygen in a package of treated product. Since yeast and mold require oxygen for their growth, these additives should diminish such growth. A drawback with this procedure is that if glucose is added to the anticaking agent, and thus to the cheese, residual glucose will induce browning of pizza cheese when baked under typical pizza baking conditions. Also, simple sugars such as glucose, if they are left in cheese, encourage growth of pathogenic and unwanted bacteria. Accordingly, glucose was not added to the present anticaking agent.

L15: Entry 103 of 133 File: USPT Nov 12, 1991

DOCUMENT-IDENTIFIER: US 5064672 A
TITLE: Functional sugar substitutes with reduced calories

BSPR:
Most artificial sweeteners in use today have a greater relative sweetness than sucrose; thus, relatively small quantities are required to deliver the desired sweetness. Such low volume sweeteners may be acceptable for certain applications (e.g., beverages), however, they do not provide sufficient bulk and functionality for use in solid and semi-solid foods like baked goods and frozen desserts. In fact, even high intensity sweetener-containing beverages have a detectable reduction in their body. Two avenues have been explored to overcome this bulking problem:

BSPR:
U.S. Pat. No. 4,459,316, Bakal, issued July 10, 1984, teaches that di- and trisaccharides containing one levohexose component and at least one dextrohexose component (e.g., .alpha.-L-glucopyranosyl-D-fructofuranose) are non-caloric. These disaccharides are costly to synthesize due to the fact that they are prepared from a racemic mixture of D-hexoses and expensive L-hexoses.

BSPR:
It has now been found, that carbohydrates in the 5-C-hydroxymethyl-hexose series can be effectively used as replacements for sugar, especially in baked goods. These carbohydrate derivatives provide sucrose-like functionality (i.e., bulk, texture and stability) with significantly reduced calories compared with sucrose. In addition, many of these carbohydrate derivatives are easier to synthesize than currently available functional sugar substitutes. It is believed that they are essentially free of the significant negative physiological effects (i.e., flatus and diarrhea) generally associated with such compounds. It has also been shown that saccharides containing a 5-C-hydroxymethyl-hexose component provide similar benefits. This also holds true for the alditols of these carbohydrates (e.g., 5-C-hydroxymethylhexitols, 5-C-hydroxymethyl-aldohexosyl polyol derivatives, alkyl derivatives (e.g., 5-C-hydroxymethyl-aldohexosyl glycerol and 5-C-hydroxymethyl-aldohexosyl-glucitol) of the carbohydrates (i.e., alkyl 5-C-hydroxymethyl-aldohexosides), and 1,6anhydro-.beta.-L-, and 1,6-anhydro-.beta.-D derivatives of the pyranose compounds (i.e., the bicyclic tautomeric forms) and the related derivatives of the ketohexoses.

BSPR:
The invention further encompasses food compositions (e.g., beverages, baked goods, frozen deserts and candies) containing the above-mentioned novel carbohydrates or their alditols.

DEPR:
The term "baked goods" refers to all manner of foods which are cooked (i.e., prepared using heat). These baked goods include, but are not limited to, foods prepared using dry heat (i.e., a radiant or convection oven), fried foods, boiled foods and foods heated in a microwave oven.

DEPR:
The term "food compositions" refers to and includes all manner of viand (both

sweetened and un-sweetened foods) for usage by man or animal. These food stuffs include, but are not limited to, baked goods, salted snacks, other flavored snacks, fruit drinks/mixes, frozen foods, candies, carbonated beverages, milk drinks/mixes, gelatins, puddings, fillings, breakfast cereals, breakfast bars, sauces, jams, jellies, whipped toppings, tablets, syrups, orally administered medicines, spreads, chewing gums and chocolates.

DEPR:
The term "galactose oxidase" as used herein refers to D-galactose: oxygen 6-oxidoreductase which is identified as E.C. 1.1.3.9 or as Chemical Abstracts Registry Number 9028-79-9.

DEPR:
Novel food compositions of the present invention contain from about 1% to about 99% of any of the above-mentioned compounds. Preferred embodiments of these food compositions include baked goods, fruit drinks/mixes, frozen foods, candies, carbonated beverages, milk drinks/mixes, gelatins, puddings, fillings, breakfast cereals, breakfast bars, sauces, jams, jellies, whipped toppings, tablets, syrups, orally administered medicines, spreads, chewing gums and chocolates. The most preferred food compositions are baked goods.

DEPR:
The reaction is conducted in a one liter vessel equipped with an aerator and a gentle stirrer. Sterile conditions are used to prevent enzyme deactivation by microbial contamination. The reaction is run at 4.degree. C. to minimize deactivation of galactose oxidase.

DEPR:
Methyl .beta.-D-galactopyranoside (1) is dissolved in the aerated phosphate buffer. The volume flow of air discharged by the aerator is regulated to produce an oxygen saturated solution while preventing foaming of the solution. At 4.degree. C., the galactose oxidase and catalase are added and this solution is aerated for 20 hours.

DEPR:
Lactitol (23) is dissolved in the aerated phosphate buffer. At 4.degree. C., the galactose oxidase and catalase are added and this solution is aerated to maintain oxygen saturation for 20 hours.

DEPR:
The ingredients are stirred with a large spoon until well blended (about 50 strokes or 1 minute) to form a batter. The batter is poured into a lightly greased 13".times.9".times.2" pan, and then baked at 350.degree. F. for about 26.5 minutes to produce the finished brownies.

DEPR:
The ingredients are combined and the resulting dough is kneaded until uniform. Dough balls (10-13 gm) are individually placed on a lightly greased cookie tray and then baked at 350.degree. F. for 7-8 minutes to produce finished cookies.

DEPR:
The ingredients are stirred with an electric mixer to form a uniform batter. The batter is poured into a lightly greased 13".times.9".times.2" pan, and then baked at 350.degree. F. for 40 minutes to produce the finished white cake. This cake looks and tastes like a conventional white cake, by has nearly no caloric value.

DEPC:
1. Oxidation of Methyl .beta.-D-Galactopyranoside with Galactose Oxidase

DETL:

##STR15##	Reagents	MW	Moles	Amount
	methyl .beta.-D-galactopyranoside	194.18	0.103	20.0 g

Sigma Chemical Co., (No. M-6757) Phosphate Buffer, 100 mM --

-- 412.0 ml Catalase, 16900 units/mg -- -- 7.5 mg Sigma Chemical Co., (No. C-40) Galactose Oxidase -- -- 9000 units

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DETL:

##STR26## ##STR27## Reagent Amount

Lactitol (23) 20.0 g (manufactured by CCA BioChem) Phosphate Buffer, 100 mM, pH 7 232.0 ml Catalase (Sigma), 16900 u/mg 7.00 mg Galactose Oxidase 9000 units

---

DETL:

Ingredient Amount (gms)

5-C-hydroxymethyl-.alpha.-L-arabino-hexopyranosyl- 309.8 g D-glucitol (as prepared in Example IX) Flour 152 g Vegetable shortening 50 g Cocoa 35.3 g Starch 11.7 g Conventional additives (flavors and a small 6.2 g amount of baking soda) Eggs 50 g Oil 63 g Water 80 g

---

DETL:

Ingredients Amounts (gms)

1,6-anhydro-5-C-hydroxymethyl- 176 .beta.-L-altropyranose (as prepared in Example II) Table Sugar (i.e., sucrose) 176 Flour 328 Shortening 196 Egg 96 Water 20 Conventional additives (flavors and a small 8 amount of baking soda) ---

DETL:

Ingredients Amount (gms)

5-C-hydroxymethyl-.alpha.-D-xylo-hexopyrano- 133 side (as prepared in Example V) Cake flour 107 Erythritol tetraester of olive oil 47.5 fatty acid (a polyol polyester used used as a shortening) Double-acting baking powder 6.7 Milk 130 Egg whites 60 Vanilla 2.5 ---

CLPR:
10. A composition according to claim 6 where the food is selected from the group consisting of baked goods, fruit drinks/mixes, frozen food, candies, carbonated beverages, milk drinks/mixes, gelatins, puddings, fillings, breakfast cereals, breakfast bars, sauces, jams, jellies, whipped toppings, tablets, syrups, orally administered medicines, spreads, chewing gums, and chocolates.

CLPR:
11. A composition according to claim 10 wherein the food is a baked good.

URNM:
Bakal

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                   Substances (PICCS) has been added to CHEMLIST
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                   Derwent World Patents Index files
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FILE 'HOME' ENTERED AT 11:30:33 ON 22 JAN 2001

=> index bioscience

FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED
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                                                 ENTRY    SESSION
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      BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CANCERLIT,
      CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE,
      DRUGB, DRUGLAUNCH, DRUGMONOG2, DRUGNL, ...' ENTERED AT 11:30:56 ON 22
JAN 2001

56 FILES IN THE FILE LIST IN STNINDEX

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=> s galactose oxidase?

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L1   QUE GALACTOSE OXIDASE?

=> s galactose? or lactose?

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L2   QUE GALACTOSE? OR LACTOSE?

=> s hemicellulase? or pentosanase? or xylanase? or arabinofuranosidase? or
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L3   QUE HEMICELLULASE? OR PENTOSANASE? OR XYLANASE? OR ARABINOFURANOSIDASE?
OR
          MAMMASE? OR GALACTANASE? OR GALACTOSIDASE?

=> s l3 (p) l1 (p) l2

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          5   FILE ANABSTR
          2   FILE BIOBUSINESS
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          0*  FILE KOSMET
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         37   FILE MEDLINE
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          7   FILE SCISEARCH
          3   FILE TOXLINE
          5   FILE TOXLIT
        222   FILE USPATFULL
          6   FILE WPIDS
          6   FILE WPINDEX

  26 FILES HAVE ONE OR MORE ANSWERS,   56 FILES SEARCHED IN STNINDEX

L4   QUE L3 (P) L1 (P) L2

=> s bak? or dough?

         98   FILE ADISALERTS
         21   FILE ADISINSIGHT
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       1041   FILE AQUASCI
      30653   FILE BIOBUSINESS
        439   FILE BIOCOMMERCE
      17873   FILE BIOSIS
       1357   FILE BIOTECHABS
       1357   FILE BIOTECHDS
       2095   FILE BIOTECHNO
  11 FILES SEARCHED...
      15842   FILE CABA
       1166   FILE CANCERLIT
      55834   FILE CAPLUS
      30080   FILE CEABA-VTB
        502   FILE CEN
       4182   FILE CIN
        706   FILE CONFSCI
        179   FILE CROPB
        546   FILE CROPU
       2933   FILE DDFB
       2367   FILE DDFU
       1528   FILE DGENE
       2933   FILE DRUGB
        291   FILE DRUGLAUNCH
```

```
      193   FILE DR[redacted]ONOG2
       13   FILE DRUGNL
     2922   FILE DRUGU
       53   FILE EMBAL
    12557   FILE EMBASE
     1942   FILE ESBIOBASE
    10670   FILE FOMAD
     4197   FILE FOREGE
    22628   FILE FROSTI
34 FILES SEARCHED...
    28227   FILE FSTA
    18106   FILE GENBANK
      210   FILE HEALSAFE
    13030   FILE IFIPAT
     7446   FILE JICST-EPLUS
       41   FILE KOSMET
     3330   FILE LIFESCI
       23   FILE MEDICONF
    19756   FILE MEDLINE
      461   FILE NIOSHTIC
     2334   FILE NTIS
      316   FILE OCEAN
       36   FILE PHAR
        4   FILE PHIC
     1773   FILE PHIN
   108809   FILE PROMT
    14313   FILE SCISEARCH
     2737   FILE TOXLINE
     2684   FILE TOXLIT
    78660   FILE USPATFULL
    54112   FILE WPIDS
    54112   FILE WPINDEX

  56 FILES HAVE ONE OR MORE ANSWERS,   56 FILES SEARCHED IN STNINDEX

L5   QUE BAK? OR DOUGH?

=> s l4 (p) l5

          1   FILE BIOBUSINESS
          0*  FILE BIOCOMMERCE
          1   FILE BIOSIS
          0*  FILE BIOTECHABS
          0*  FILE BIOTECHDS
          0*  FILE BIOTECHNO
          0*  FILE CEABA-VTB
          0*  FILE CIN
  20 FILES SEARCHED...
          0*  FILE ESBIOBASE
          0*  FILE FOMAD
          0*  FILE FOREGE
          3*  FILE FROSTI
          0*  FILE FSTA
          0*  FILE KOSMET
  41 FILES SEARCHED...
          0*  FILE MEDICONF
          0*  FILE NTIS

    3 FILES HAVE ONE OR MORE ANSWERS,   56 FILES SEARCHED IN STNINDEX

L6   QUE L4 (P) L5

=> d rank

F1            3*  FROSTI
F2            1   BIOBUSINESS
```

F3 1 BIOS

=> file f1-f3

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	5.40	5.55

FILE 'FROSTI' ENTERED AT 11:37:54 ON 22 JAN 2001
COPYRIGHT (C) 2001 Leatherhead Food Research Association

FILE 'BIOBUSINESS' ENTERED AT 11:37:54 ON 22 JAN 2001
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FILE 'BIOSIS' ENTERED AT 11:37:54 ON 22 JAN 2001
COPYRIGHT (C) 2001 BIOSIS(R)

=> s l6

PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'L3 (P) L1'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'L1 (P) L2'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'L4 (P) L5'
L7 5 L6

=> dup rem l7

PROCESSING COMPLETED FOR L7
L8 4 DUP REM L7 (1 DUPLICATE REMOVED)

=> d 1-4 ab,bib

L8 ANSWER 1 OF 4 FROSTI COPYRIGHT 2001 LFRA
AB Arabinogalactan-peptide (AGP) is a group of water-soluble macromolecules with a highly branched structure. The amino acid composition of the peptidic fraction could provide functional properties through serving as a link to the carbohydrate fraction. The possible use of wheat flour AGP or its degradation products as a substrate for an oxidative enzyme was evaluated with **galactose oxidase**. This enzyme could be an alternative oxidative enzyme for use in bread-making. The composition and depolymerization of wheat flour AGP were determined. The effects of selected enzymic activities on oxidation were also evaluated. A crude liquid enzyme preparation from Aspergillus niger displayed activities capable of depolymerizing wheat flour AGP to galactobiose, **galactose** and arabinose. It could also produce substrate from the wheat flour AGP, associated with alpha-L-**arabinofuranosidase**.
AN 496464 FROSTI
TI Production of substrate for **galactose oxidase** by depolymerization of an arabinogalactan-peptide from wheat flour.
AU Schroder M.; Soe J.B.; Zargahi M.R.; Rouau X.
SO Journal of Agricultural and Food Chemistry, 1999, (April), 47 (4), 1483-1488 (19 ref.)
ISSN: 0021-8561
DT Journal
LA English
SL English

L8 ANSWER 2 OF 4 BIOBUSINESS COPYRIGHT 2001 BIOSIS DUPLICATE 1
AN 96:71597 BIOBUSINESS
DN 0836458
TI Application of oxidoreductases in baking: Impact of some oxidoreductases on gluten structure and dough rheology.

AU Somers W A C; Or[redacted] R; Van Der Lugt J P
CS TNO Nutrition Food Res. Inst., P.O. Box 360, 3700 Zeist, Netherlands
SO Cereal Foods World, (1996) Vol.41, No.7, P.550.
81st Annual Meeting of the American Association of Cereal Chemistry, Baltimore, Maryland, USA, September 15-19, 1996. CEREAL FOODS WORLD.
ISSN:
0146-6283.
DT CONFERENCE
FS NONUNIQUE
LA ENGLISH

L8 ANSWER 3 OF 4 FROSTI COPYRIGHT 2001 LFRA
AB A composition for **dough** and bread improvement is disclosed. It incorporates an enzyme with **galactose oxidase** activity and an oxidizable substrate for this enzyme. It is said to improve the rheological properties of flour **doughs** and the quality characteristics of bread products. Desirable quality characteristics include soft crumb structure, high specific volume, and freedom from staling within the expected shelf-life of fresh bread. **Galactose oxidase** acts as an oxidoreductase, and its use overcomes problems associated with use of cellulases or **hemicellulases** in flour **doughs**. Because the natural **galactose** content of cereal flours is very low, it is beneficial to include an oxidizable substrate in the formulation.
AN 489211 FROSTI
TI A composition comprising an enzyme having **galactose oxidase** activity and use thereof.
IN Rouau X.; Schroder M.; Soe J.B.
PA Danisco A/S
SO PCT Patent Application
PI WO 9903351 A1
AI 19980716
PRAI Denmark 19970718
United States 19970722
DT Patent
LA English
SL English

L8 ANSWER 4 OF 4 FROSTI COPYRIGHT 2001 LFRA
AB A composition for **dough** and bread improvement is disclosed. It incorporates an enzyme with **galactose oxidase** activity and an oxidizable substrate for this enzyme. It is said to improve the rheological properties of flour **doughs** and the quality characteristics of bread products. Desirable quality characteristics include soft crumb structure, high specific volume, and freedom from staling within the expected shelf-life of fresh bread. **Galactose oxidase** acts as an oxidoreductase, and its use overcomes problems associated with use of cellulases or **hemicellulases** in flour **doughs**. Because the natural **galactose** content of cereal flours is very low, it is beneficial to include an oxidizable substrate in the formulation.
AN 526332 FROSTI
TI A composition comprising an enzyme having **galactose oxidase** activity and use thereof.
IN Rouau X.; Schroder M.; Soe J.B.
PA Danisco A/S
SO European Patent Application
PI EP 999752 A1
WO 9903351 19990128
AI 19980716
PRAI Denmark 19970718
United States 19970722
DT Patent
LA English
SL English

```
=> in dex bioscience

IN IS NOT A RECOGNIZED COMMAND
The previous command name entered was not recognized by the system.
For a list of commands available to you in the current file, enter
"HELP COMMANDS" at an arrow prompt (=>).

=> index bioscience

FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     6.93      12.48

INDEX 'ADISALERTS, ADISINSIGHT, AGRICOLA, ANABSTR, AQUASCI, BIOBUSINESS,
       BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CANCERLIT,
       CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE,
       DRUGB, DRUGLAUNCH, DRUGMONOG2, DRUGNL, ...' ENTERED AT 11:39:07 ON 22
JAN 2001

56 FILES IN THE FILE LIST IN STNINDEX

Enter SET DETAIL ON to see search term postings or to view
search error messages that display as 0* with SET DETAIL OFF.

=> s l4 and l5

          1   FILE BIOBUSINESS
          0*  FILE BIOCOMMERCE
          1   FILE BIOSIS
          0*  FILE BIOTECHABS
          0*  FILE BIOTECHDS
          0*  FILE BIOTECHNO
  14 FILES SEARCHED...
          0*  FILE CEABA-VTB
          0*  FILE CIN
          0*  FILE ESBIOBASE
          0*  FILE FOMAD
          0*  FILE FOREGE
          3*  FILE FROSTI
          0*  FILE FSTA
  35 FILES SEARCHED...
          0*  FILE KOSMET
          0*  FILE MEDICONF
          0*  FILE NTIS
         66   FILE USPATFULL

   4 FILES HAVE ONE OR MORE ANSWERS,   56 FILES SEARCHED IN STNINDEX

L9   QUE L4 AND L5

=> d rank

F1          66   USPATFULL
F2           3*  FROSTI
F3           1   BIOBUSINESS
F4           1   BIOSIS

=> s l1 (p) ((l2 or l3))

         56   FILE AGRICOLA
         41   FILE ANABSTR
          2   FILE AQUASCI
         16   FILE BIOBUSINESS
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        3*  FILE BIOCOMMERCE
     1028   FILE BIOSIS
      110*  FILE BIOTECHABS
      110*  FILE BIOTECHDS
      242*  FILE BIOTECHNO
       91   FILE CABA
      293   FILE CANCERLIT
     1305   FILE CAPLUS
       22*  FILE CEABA-VTB
        1   FILE CEN
        1*  FILE CIN
       37   FILE CONFSCI
       21   FILE DDFB
        6   FILE DDFU
       13   FILE DGENE
23 FILES SEARCHED...
       21   FILE DRUGB
       16   FILE DRUGU
        1   FILE EMBAL
      688   FILE EMBASE
       88*  FILE ESBIOBASE
        0*  FILE FOMAD
        0*  FILE FOREGE
       20*  FILE FROSTI
       23*  FILE FSTA
        7   FILE GENBANK
        1   FILE HEALSAFE
      100   FILE IFIPAT
      135   FILE JICST-EPLUS
        2*  FILE KOSMET
      206   FILE LIFESCI
        0*  FILE MEDICONF
      833   FILE MEDLINE
        4   FILE NIOSHTIC
        5*  FILE NTIS
        2   FILE PHIN
        6   FILE PROMT
      548   FILE SCISEARCH
51 FILES SEARCHED...
       60   FILE TOXLINE
       72   FILE TOXLIT
      691   FILE USPATFULL
       88   FILE WPIDS
       88   FILE WPINDEX

 43 FILES HAVE ONE OR MORE ANSWERS,   56 FILES SEARCHED IN STNINDEX

L10  QUE L1 (P) ((L2 OR L3))

=> s l10 and l5

        1   FILE BIOBUSINESS
        0*  FILE BIOCOMMERCE
        1   FILE BIOSIS
        0*  FILE BIOTECHABS
        0*  FILE BIOTECHDS
        0*  FILE BIOTECHNO
        3   FILE CAPLUS
        1*  FILE CEABA-VTB
        0*  FILE CIN
 22 FILES SEARCHED...
        0*  FILE ESBIOBASE
        0*  FILE FOMAD
        0*  FILE FOREGE
        3*  FILE FROSTI
        0*  FILE FSTA
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          1   FILE GE[redacted]NK
          2   FILE IFI[redacted]T
          0*  FILE KOSMET
          0*  FILE MEDICONF
          0*  FILE NTIS
  48 FILES SEARCHED...
        129   FILE USPATFULL
          2   FILE WPIDS
          2   FILE WPINDEX

  10 FILES HAVE ONE OR MORE ANSWERS,   56 FILES SEARCHED IN STNINDEX

L11  QUE L10 AND L5

=> d rank

F1          129   USPATFULL
F2            3   CAPLUS
F3            3*  FROSTI
F4            2   IFIPAT
F5            2   WPIDS
F6            2   WPINDEX
F7            1   BIOBUSINESS
F8            1   BIOSIS
F9            1   GENBANK
F10           1*  CEABA-VTB


=> file f2-f10

COST IN U.S. DOLLARS                          SINCE FILE      TOTAL
                                                   ENTRY    SESSION
FULL ESTIMATED COST                                3.15      15.63

FILE 'CAPLUS' ENTERED AT 11:43:01 ON 22 JAN 2001
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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FILE 'IFIPAT' ENTERED AT 11:43:01 ON 22 JAN 2001
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FILE 'WPIDS' ENTERED AT 11:43:01 ON 22 JAN 2001
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FILE 'WPINDEX' ACCESS NOT AUTHORIZED

FILE 'BIOBUSINESS' ENTERED AT 11:43:01 ON 22 JAN 2001
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FILE 'BIOSIS' ENTERED AT 11:43:01 ON 22 JAN 2001
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FILE 'GENBANK' ENTERED AT 11:43:01 ON 22 JAN 2001

FILE 'CEABA-VTB' ENTERED AT 11:43:01 ON 22 JAN 2001
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=> s l11

PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'L1 (P) '
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
```

FIELD CODE - 'AND' OPERATOR ASSUMED 'L1 (P) '
L12 14 L11

=> dup rem l12

DUPLICATE IS NOT AVAILABLE IN 'GENBANK'.
ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE
PROCESSING COMPLETED FOR L12
L13 13 DUP REM L12 (1 DUPLICATE REMOVED)

=> d 1-13 ab,bib

NO VALID FORMATS ENTERED FOR FILE 'GENBANK'
In a multifile environment, each file must have at least one valid format requested. Refer to file specific help messages or the STNGUIDE file for information on formats available in individual files.
REENTER DISPLAY FORMAT FOR ALL FILES (FILEDEFAULT):all

L13 ANSWER 1 OF 13 WPIDS COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1999-131751 [11] WPIDS
DNC C1999-038439
TI A **dough** and bread improving composition comprising a **galactose oxidase** and a substrate for it - useful for improving the rheological characteristics of flour **dough** with a **dough** strengthening effect, without stickiness and/or slackness.
DC D11 D16
IN ROUAU, X; SCHRODER, M; SOE, J B
PA (DANI-N) DANISCO AS
CYC 83
PI WO 9903351 A1 19990128 (199911)* EN 41p A21D008-04
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW
AU 9883347 A 19990210 (199925) A21D008-04
EP 999752 A1 20000517 (200028) EN A21D008-04
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
ADT WO 9903351 A1 WO 1998-DK335 19980716; AU 9883347 A AU 1998-83347 19980716;
EP 999752 A1 EP 1998-933577 19980716, WO 1998-DK335 19980716
FDT AU 9883347 A Based on WO 9903351; EP 999752 A1 Based on WO 9903351
PRAI US 1997-53451 19970722; DK 1997-878 19970718
IC ICM A21D008-04
ICS A23L001-16
AB WO 9903351 A UPAB: 19990316
A **dough** and bread improving composition comprises (a) an enzyme having **galactose oxidase** activity, and (b) an oxidisable substrate for (a) and/or an enzyme which can convert a compound into this substrate. Also claimed is a method of preparing a flour **dough**.
USE - The composition is useful for improving the rheological characteristics of flour **dough** with a **dough** strengthening effect, without stickiness and/or slackness
ADVANTAGE - Any type of flour **dough** can be used, e.g. wheat flour based bread products, noodle products, alimentary paste product, etc.
Dwg.0/4
FS CPI
FA AB
MC CPI: D01-B01; D01-B02A; D05-A02A

L13 ANSWER 2 OF 13 FROSTI COPYRIGHT 2001 LFRA
AN 496464 FROSTI
TI Production of substrate for **galactose oxidase** by depolymerization of an arabinogalactan-peptide from wheat flour.
AU Schroder M.; Soe J.B.; Zargahi M.R.; Rouau X.
SO Journal of Agricultural and Food Chemistry, 1999, (April), 47 (4), 1483-1488 (19 ref.)
ISSN: 0021-8561
DT Journal
LA English
SL English
AB Arabinogalactan-peptide (AGP) is a group of water-soluble macromolecules with a highly branched structure. The amino acid composition of the peptidic fraction could provide functional properties through serving as a link to the carbohydrate fraction. The possible use of wheat flour AGP or its degradation products as a substrate for an oxidative enzyme was evaluated with **galactose oxidase**. This enzyme could be an alternative oxidative enzyme for use in bread-making. The composition and depolymerization of wheat flour AGP were determined. The effects of selected enzymic activities on oxidation were also evaluated. A crude liquid enzyme preparation from Aspergillus niger displayed activities capable of depolymerizing wheat flour AGP to galactobiose, **galactose** and arabinose. It could also produce substrate from the wheat flour AGP, associated with alpha-L-**arabinofuranosidase**.
SH CEREAL PRODUCTS
CT ARABINOGALACTAN PEPTIDE; ASPERGILLUS; ASPERGILLUS NIGER; **BAKERY** PRODUCTS; BREAD; CEREAL FLOURS; CEREAL PRODUCTS; COMPOSITION; DEPOLYMERIZATION; ENZYMIC ACTIVITY; FLOURS; FUNGI; **GALACTOSE OXIDASE**; MICROORGANISMS; SUBSTRATES; WHEAT FLOUR; WHEAT PRODUCTS
DED 17 Jun 1999

L13 ANSWER 3 OF 13 CAPLUS COPYRIGHT 2001 ACS
AN 1998:454862 CAPLUS
DN 129:215945
TI Application of oxidoreductases in **baking**: impact on gluten structure and **dough** rheology
AU Van Der Lugt, J. P.; Somers, W. A. C.; Lichtendonk, W.; Orsel, R.
CS TNO Nutrition and Food Research Institute, Zeist, 3700 AJ, Neth.
SO Eur. Symp. Enzymes Grain Process., Proc., 1st (1997), Meeting Date 1996, 164-176. Editor(s): Angelino, S. A. G. F. Publisher: TNO Nutrition and Food Research Institute, Zeist, Neth.
CODEN: 66KVAR
DT Conference
LA English
CC 17-11 (Food and Feed Chemistry)
AB Rheol. measurements of **dough** and glutenin macro polymer systems were used to study effects of enzymes. Glucose oxidase improved the complex modulus (G*). **Galactose oxidase** under favorable conditions resulted in better **dough** rigidity and increased the elastic behavior of the **dough**. Lignin peroxidase gave the opposite effect. Lipoxygenase increased G*, presumably due to oxidn. of protein polymers.
ST gluten rheol **dough** enzyme; glucose oxidase gluten rheol **dough**; **galactose oxidase** gluten rheol **dough**; lignin peroxidase gluten rheol **dough**; lipoxygenase gluten rheol **dough**
IT **Baking**
Dough
Food elasticity
Food rheology
(oxidoreductases in relation to gluten structure and **dough** rheol.)
IT Glutens
RL: BPR (Biological process); PRP (Properties); BIOL (Biological study); PROC (Process)
(oxidoreductases in relation to gluten structure and **dough**

rheol.)

IT 9001-37-0, Glucose oxidase 9028-79-9, **Galactose oxidase** 9029-60-1, Lipoxygenase 42613-30-9, Lignin peroxidase
RL: BAC (Biological activity or effector, except adverse); FFD (Food or feed use); BIOL (Biological study); USES (Uses)
(oxidoreductases in relation to gluten structure and **dough** rheol.)

L13 ANSWER 4 OF 13 CAPLUS COPYRIGHT 2001 ACS
AN 1996:365938 CAPLUS
DN 125:32391
TI Anticaking agent for dairy products
IN Reddy, Malireddy S.
PA USA
SO PCT Int. Appl., 56 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM A23C019-14
CC 17-8 (Food and Feed Chemistry)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 9611581	A1	19960425	WO 1995-US12860	19951017
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
US 5626893	A	19970506	US 1994-324897	19941018
AU 9538278	A1	19960506	AU 1995-38278	19951017
AU 689335	B2	19980326		
EP 786941	A1	19970806	EP 1995-936266	19951017
R: DE, DK, FR, GB				

PRAI US 1994-324897 19941018
WO 1995-US12860 19951017

AB An anticaking agent which reduces the stickiness of the chunked, diced, or shredded cheese and improves the functionality of cheese is formulated of fine mesh vegetable flour, bentonite, cellulose, and antimycotic agents or bacterial cultures. This anticaking agent also will reduce the yeast and mold growth. This discovery is also extended to include various flavors, colors, enzymes and other supplements into the anticaking agent, which are to be ultimately added to the cheese.

ST dairy product anticaking agent

IT Agglomeration preventers
Bifidobacterium bifidum
Capsicum
Capsicum frutescens
Cheese
Corn
Dill
Emulsifying agents
Flavor
Flours and Meals
Fungicides and Fungistats
Garlic
Lactobacillus acidophilus
Lactobacillus bulgaricus
Lactobacillus helveticus
Lactobacillus lactis
Lactococcus lactis

Leuconostoc mesenteroides
Milk
Oregano
Pediococcus acidilactici
Pediococcus cerevisiae
Pediococcus pentosaceus
Potato
Propionibacterium freudenreichii
Propionibacterium shermanii
Rice
Streptococcus salivarius
Wheat
Whey
Yeast
(anticaking agent for dairy products)

IT Vitamins
RL: BAC (Biological activity or effector, except adverse); FFD (Food or feed use); BIOL (Biological study); USES (Uses)
(anticaking agent for dairy products)

IT Bentonite, biological studies
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process); USES (Uses)
(anticaking agent for dairy products)

IT Carboxylic acids, biological studies
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process); USES (Uses)
(anticaking agent for dairy products)

IT Phosphates, biological studies
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process); USES (Uses)
(anticaking agent for dairy products)

IT Flavoring materials
(spice; anticaking agent for dairy products)

IT Flavoring materials
(Cheddar cheese; anticaking agent for dairy products)

IT Cheese
(Monterey Jack, anticaking agent for dairy products)

IT Cheese
(Mozzarella, anticaking agent for dairy products)

IT Cheese
(Parmesan, anticaking agent for dairy products)

IT Cheese
(Romano, anticaking agent for dairy products)

IT Flavoring materials
(cheese, anticaking agent for dairy products)

IT Food functional properties
(emulsifying, anticaking agent for dairy products)

IT Food functional properties
(foaming, anticaking agent for dairy products)

IT Flavoring materials
(fruit, anticaking agent for dairy products)

IT **Bakery** products
(pizza, anticaking agent for dairy products)

IT 64-19-7, Acetic acid, biological studies 65-85-0, Benzoic acid, biological studies 79-09-4D, Propionic acid, salts 110-44-1D, Sorbic acid, salts 137-40-6, Sodium propionate 431-03-8, Diacetyl 1406-16-2, Vitamin D 7681-93-8, Natamycin 9001-05-2, Catalase 9001-37-0, Glucose oxidase 9028-79-9, **Galactose oxidase** 9031-11-2, Lactase 11103-57-4, Vitamin A
RL: BAC (Biological activity or effector, except adverse); FFD (Food or feed use); BIOL (Biological study); USES (Uses)
(anticaking agent for dairy products)

IT 50-99-7, Dextrose, biological studies
RL: FFD (Food or feed use); BIOL (Biological study); USES (Uses)
(anticaking agent for dairy products)

IT 50-21-5, Lactic acid, biological studies 50-81-7, Ascorbic acid,

biological studi[redacted] 68-04-2, Sodium citrate 77[redacted]-9, Citric acid, biological studi[redacted] 471-34-1, Calcium carbonate, [redacted]ological studies 1393-63-1, Annatto 7601-54-9, Sodium phosphate 7664-38-2, Phosphoric acid, biological studies 9004-34-6, Cellulose, biological studies 9005-25-8, Starch, biological studies 9016-00-6, Polydimethyl siloxane 9050-36-6, Maltodextrin 13478-98-3, Hexametaphosphate
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process); USES (Uses)
(anticaking agent for dairy products)

IT 1318-93-0, Sodium montmorillonite, biological studies
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process); USES (Uses)
(sodium-exchanged; anticaking agent for dairy products)

L13 ANSWER 5 OF 13 BIOBUSINESS COPYRIGHT 2001 BIOSIS DUPLICATE 1
AN 96:71597 BIOBUSINESS
DN 0836458
TI Application of oxidoreductases in **baking**: Impact of some oxidoreductases on gluten structure and **dough** rheology.
AU Somers W A C; Orsel R; Van Der Lugt J P
CS TNO Nutrition Food Res. Inst., P.O. Box 360, 3700 AJ Zeist, Netherlands
SO Cereal Foods World, (1996) Vol.41, No.7, P.550.
81st Annual Meeting of the American Association of Cereal Chemistry, Baltimore, Maryland, USA, September 15-19, 1996. CEREAL FOODS WORLD.
ISSN:
0146-6283.
DT CONFERENCE
FS NONUNIQUE
LA ENGLISH
CC 40200 **BAKING** TECHNOLOGY; 40300 CEREAL CHEMISTRY; 40400 CHEMICAL & PHYSICAL PROPERTIES OF FOODS; 40900 FOOD PREPARATION, PROCESSING & STORAGE
ST MEETING ABSTRACT; HYDROGEN PEROXIDE; **GALACTOSE OXIDASE**; GLUCOSE OXIDASE; **HEMICELLULASE**; POLYMER SIZE; DISULFIDE BOND; LOAF VOLUME; **BAKERY** PRODUCTS; GRAIN PRODUCTS; FOOD PROCESSING; FOOD CHEMISTRY
RN 7722-84-1 (HYDROGEN PEROXIDE)
9001-37-0 (GLUCOSE OXIDASE)
9025-56-3 (**HEMICELLULASE**)
9028-79-9 (**GALACTOSE OXIDASE**)
16734-12-6 (DISULFIDE)

L13 ANSWER 6 OF 13 CAPLUS COPYRIGHT 2001 ACS
AN 1994:279904 CAPLUS
DN 120:279904
TI Stabilized chewable antimicrobial foodstuff for animal
IN Montgomery, Robert E.
PA USA
SO PCT Int. Appl., 30 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM A61K007-28
ICS A61K037-50
CC 62-7 (Essential Oils and Cosmetics)
Section cross-reference(s): 18
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 9405252	A1	19940317	WO 1993-US8086	19930827
W: AU, CA				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5310541	A	19940510	US 1992-936929	19920827
~~EP 658096~~	~~A1~~	~~19950621~~	EP 1993-921221	19930827
EP 658096	B1	19991103		
R: DE, ES, FR, GB, IT, NL				

ES 2141171 [redacted]3 20000316 ES 1993-921[redacted] 19930827
PRAI US 1992-936929 [redacted]9920827
WO 1993-US8086 19930827

AB The invention is an animal chew which contains one or more enzymes and substrates for the purpose of generating antimicrobial compds. upon contact with an animal's saliva. The animal chew, made of rawhide, biscuit or dried animal food is provided with an oxidoreductase enzyme and substrate, such as glucose oxidase and glucose, which produces H2O2 upon being chewed. A catalase may be provided to stabilize the system and prevent premature activation of the enzyme/substrate system. A peroxidase and halide or pseudohalide ion combination may be provided to enhance the antimicrobial effect of the invention.

ST chewable antimicrobial animal dentifrice enzyme peroxide

IT Chlorides, biological studies
Halides
Iodides, biological studies
Pseudohalides
RL: BIOL (Biological study)
(antimicrobial animal chewing foodstuff contg. oxidoreductase and peroxidase and, for inhibiting oral pathogens)

IT Dentifrices
(bactericidal, chewable, for animal, oxidoreductase and enzyme substrate in)

IT Hide substances
(raw-, antimicrobial animal chewing foodstuff contg. oxidoreductase and peroxidase and enzyme substrates and, for inhibiting oral pathogens)

IT **Bakery** products
(biscuits, for animal, antimicrobial animal chewing foodstuff contg. oxidoreductase and peroxidase and enzyme substrates and, for inhibiting oral pathogens)

IT Food
(dry, for animal, antimicrobial animal chewing foodstuff contg. oxidoreductase and peroxidase and enzyme substrates and, for inhibiting oral pathogens)

IT 9003-99-0, Lactoperoxidase 9055-20-3, Chloroperoxidase
RL: BIOL (Biological study)
(antimicrobial animal chewing foodstuff contg. oxidoreductase and enzyme substrates and, for inhibiting oral pathogens)

IT 333-20-0, Potassium thiocyanate 540-72-7, Sodium thiocyanate 1762-95-4, Ammonium thiocyanate 7647-14-5, Sodium chloride, biological studies 7681-11-0, Potassium iodide, biological studies
RL: BIOL (Biological study)
(antimicrobial animal chewing foodstuff contg. oxidoreductase and peroxidase and, for inhibiting oral pathogens)

IT 50-99-7, D-Glucose, biological studies 51-67-2, Tyramine 59-23-4, d-Galactose, biological studies 64-17-5, Ethanol, biological studies 69-89-6, Xanthine 75-07-0, Acetaldehyde, biological studies 79-14-1, Glycolic acid, biological studies 79-33-4, L-Lactic acid, biological studies 87-79-6, L-Sorbose 95-55-6, 2-Aminophenol 110-60-1, 1,4-Diaminobutane 123-72-8, Butyraldehyde 154-17-6, 2-Deoxy-D-glucose 1783-96-6, D-Aspartic acid 6893-26-1, D-Glutamic acid 10516-09-3 13748-90-8, L-2-Hydroxyisocaproic acid 14474-04-5 22956-40-7 32746-79-5 106623-56-7
RL: BIOL (Biological study)
(antimicrobial animal chewing foodstuff contg. oxidoreductase and, for inhibiting oral pathogens)

IT 9000-88-8, D-Amino acid oxidase 9000-89-9, L-Amino acid oxidase 9001-37-0, Glucose oxidase 9001-53-0, Diamine oxidase 9001-66-5, Monoamine oxidase 9028-71-1, Glycollate oxidase 9028-72-2, Lactate oxidase 9028-78-8 9028-79-9, **Galactose oxidase** 9029-21-4, Pyridoxaminephosphate oxidase 9029-38-3, Sulfite oxidase

RL: BIOL (Biological study)
(antimicrobial animal chewing foodstuff contg. for inhibiting oral pathogens)

L13 ANSWER 7 OF 13 CEABA-VTB COPYRIGHT 2001 DECHEMA
AN 1995(07):1196 CEABA-VTB FS B
DN CEABA: 1995:5081821
TI Microbial cometabolism of sucralose, a chlorinated disaccharide, in environmental samples
AU Labare, M.P.; Alexander, M. (Cornell Univ., Ithaca NY, USA)
SO Appl. Microbiol. Biotechnol. (1994) 42(1), p.173-178, 5f,1t,12l
CODEN: AMBIDG ISSN: 0175-7598
DT Journal
LA English
AB The paper reports on investigations into the mineralization of sucralose (4-chloro-4-deoxy-.alpha.,D-fructofuranoside). During rapid mineralization in soil and slow mineralization in lake water, a corresponding unsaturated aldehyde appeared to be the metabolic product. Organic products from the disaccharide were not detected in sewage under aerobic conditions and little or no CO2 was detected under anaerobic conditions. Sucralose carbon was not found in the cells of sucralose-metabolizing bacteria or the microbial mass of sewage. A **galactose oxidase** slowly metabolized the chlorinated disaccharide and it is concluded that sucralose transformation is the result of microbial cometabolism. (Hryniewicz)
CC 9442 Water treatment
141 Organic chemistry
145 Microbial and biochemical reactions
9141 Bacteria, cyanobacterial (Prokaryota)
CT BACTERIA; ENVIRONMENTAL POLLUTION; ENZYME; TRANSFORMATION

L13 ANSWER 8 OF 13 IFIPAT COPYRIGHT 2001 IFI
AN 2417486 IFIPAT;IFIUDB;IFICDB
TI STABILIZED ENZYMATIC ANTIMICROBIAL COMPOSITIONS; ADDITION OF CATALASE TOGETHER WITH OXIDOREDUCTASE PREVENTS FORMATION OF HYDROGEN PEROXIDE SO PREVENT THE SALIVARY PEROXIDASE SYSTEM PRODUCING HYPOTHIOCYANITE
INF Montgomery, Robert E, 8916 Hollywood Hills Rd, Los Angeles, CA, 90046
IN Montgomery Robert E
PAF Unassigned
PA Unassigned Or Assigned To Individual (68000)
EXNAM Rose, Shep K
AG Blakely, Sokoloff, Taylor, Zafman
PI US 5262151 19931116 (CITED IN 002 LATER PATENTS)
AI US 1992-934772 19920824
XPD 25 Nov 2011
RLI US 1991-797776 19911125 CONTINUATION-IN-PART 5176899
FI US 5262151 19931116
US 5176899
DT UTILITY
FS CHEMICAL
AB A stabilized aqueous composition capable of producing or, in the presence of saliva or other humoral fluid, leading to the production of antimicrobially effective concentrations of hypothiocyanite ions (OSCN-) are herein described. The composition contains an oxidoreductase enzyme and its specific substrate, for the purpose of producing hydrogen peroxide of at least the minimum effective concentration, and in addition, catalase for the destruction of hydrogen peroxide to prevent premature oxidoreductase enzyme decomposition. Optionally, a peroxidase enzyme may be included to act upon the aforementioned hydrogen peroxide, thereby oxidizing thiocyanate ions to produce the antimicrobial concentrations of hypothiocyanite ions (OSCN).
CLMN 23
ECLM 1. An antimicrobial dentifrice composition made by the process comprising the steps of: providing a fluid carrier comprising an oxidoreductase

enzyme, an oxi[redacted]ductase enzyme substrate and a[redacted]talase, wherein said enzyme and substrate form hydrogen peroxide when reacted together in the presence of oxygen, said hydrogen peroxide being formed at a rate of at least 100 micromoles per liter per minute, said oxidoreductase enzyme being present in said composition in the amount of at least 1.0 Tritrmetric Unit per gram of dentifrice, and wherein said catalase is provided in a ratio of about 50 Titrimetric Units oxidoreductase enzyme to 1.0 **Baker** Unit of catalase, to 1.0 Titrimetric Units oxidoreductase enzyme to 1.0 **Baker** Unit of catalase to substantially minimize the amount of hydrogen peroxide produced in said composition during storage; and storing said mixture in an oxygen impervious container.

ACLM 2. The composition of claim 1 wherein catalase is provided in an amount in the ratio range of 50 Titrimetric Units of oxidoreductase to 1.0 **Baker** Unit of catalase, to 1.0 Titrimetric Units of oxidoreductase to 1.0 **Baker** Unit of catalase.

3. The composition of claim 2 wherein the ratio of oxidoreductase to catalase is about 6.0 Titrimetric Units of oxidoreductase to 1.0 **Baker** Unit of catalase.

4. The composition of claim 1 further comprising a peroxidase enzyme for oxidizing thiocyanate ions to hypothiocyanite ions.

5. The composition of claim 1 wherein said oxidoreductase is selected from the group consisting of glucose oxidase, **galactose oxidase**, glycollate oxidase, lactate oxidase, L-gulunolactone oxidase, L-2-hydroxyacid oxidase, aldehyde oxidase, xanthine oxidase, D-aspartate oxidase, L-amino acid oxidase, D-amino acid oxidase, monoamine oxidase, pyridoxaminephosphate oxidase, diamine oxidase, and sulfite oxidase.

6. The composition of claim 1 wherein said oxidoreductase is glucose oxidase.

7. The composition of claim 1 wherein said substrates are specific to the particular oxidoreductase and are selected from D-glucose, D-**galactose**, L-sorbose, ethanol, tyramine, 1, 4-diaminobutane, 6-hydroxy-L-nicotine, 6-hydroxy-D-nicotine, 2-aminophenol, glycollate, L-lactate, 2'-deoxy-D-Glucose, L-gulunolactone, L-galactonolactone, D-mannonolactone, L-2-hydroxyisocaproate, acetaldehyde, butyraldehyde, xanthine, D-aspartate, D-glutamate, L-amino acids and D-amino acids.

8. The composition of claim 1 wherein said oxidoreductase is glucose oxidase and said substrate is D-glucose.

9. The composition of claim 3 wherein the peroxidase enzyme is selected from lactoperoxidase, myeloperoxidase, salivary peroxidase, and chloroperoxidase.

10. The composition of claim 9 wherein the peroxidase is lactoperoxidase.

11. The composition of claim 1 wherein the catalase is derived from A. niger fermentation.

12. The composition of claim 1, wherein said composition comprises a fluid carrier, comprised of water, in an amount ranging from about 10% to about 90% by weight of the composition.

13. The composition of claim 1 further comprising a humectant selected from glycerine, propylene glycol, sorbitol (70% solution), polyethylene glycols, polypropylene glycols, and mixtures thereof.

14. The composition of claim 12 wherein said water comprises in the range from about 5% to about 50% by weight of said composition.

15. The composition of claim 1 further comprising a thickener selected from natural and synthetic water-soluble polymers selected from sodium carboxymethylcellulose, xanthan gum, carrageenan, locust bean gum, gum tragacanth, hydroxyethylcellulose, sodium alginate, starch, polyvinylpyrrolidone and polyacrylic acid and inorganic thickeners selected from magnesium aluminum silicate, hectorites and hydrated silicas.

16. The composition of claim 1 further comprising abrasives selected from

the group consisting of calcium pyrophosphate, calcium carbonate, hydrated silica, aluminum hydroxide, dicalcium phosphate dihydrate, tricalcium phosphate, sodium metaphosphate, potassium metaphosphate, aluminum silicate, finely divided poly(methyl methacrylate), and mixtures thereof.

17. The composition of claim 1 wherein said composition further comprises a physiologically acceptable buffer.

18. The composition of claim 17 wherein said physiologically acceptable buffer is selected from potassium phosphate, sodium phosphate, disodium phosphate, dipotassium phosphate, and mixtures thereof.

19. The composition of claim 1 further comprising additives selected from the group comprising preservatives, whiteners, dyes, fluorides, antitartar and anticalculus agents, chlorophyll compounds, ammoniated materials, flavorings and sweeteners.

20. Method of making a dentifrice composition comprising the steps of: mixing together an oxidoreductase enzyme, an oxidoreductase enzyme substrate and a catalase, wherein said enzyme and substrate form hydrogen peroxide when reacted together, said hydrogen peroxide being formed at a rate of at least 100 micromoles per liter per minute said oxidoreductase enzyme being present in said composition in the amount of at least 1.0 Titrimetric Unit per gram of dentifrice and wherein said oxidoreductase enzyme and catalase are present in a fluid carrier in a ratio of about 50 Titrimetric Units oxidoreductase enzyme to 1.0 **Baker** Unit of catalase, to 1.0 Titrimetric Units oxidoreductase enzyme to 1.0 **Baker** Unit of catalase; and storing said mixture in an oxygen impervious container.

21. The method of claim 20 wherein the composition is made either under a partial vacuum or in an oxygen free atmosphere after said oxidoreductase enzyme and an oxidoreductase enzyme substrate are added thereto.

22. The method claim 21 wherein said step of limiting the amount of oxygen in said composition is performed under an inert gas.

23. An anaerobically packaged composition with an antimicrobial system comprising: a fluid carrier comprising an oxidoreductase enzyme and an oxidoreductase enzyme substrate, wherein said enzyme and substrate form hydrogen peroxide when reacted together in the presence of oxygen, said hydrogen peroxide is formed at a rate of at least 100 micromoles per liter per minute; and catalase provided in sufficient amount to substantially reduce the amount of hydrogen peroxide in said composition;

said composition being packaged in an oxygen impervious package or container.

REP	US 2482724	Sep 1949	426010000	Baker
	US 2732988	Jan 1956	226051000	Feinstein
	US 2765233	Oct 1956	094178000	Sarett et al.
	US 3182432	May 1965	053112000	Canfield
	US 3430414	Mar 1969	053079000	Ludwig et al.
	US 3518809	Jul 1970	053112000	Ott
	US 4055931	Nov 1977	053022000	Myers
	US 4269822	May 1981	424050000	Pellico et al.
	US 4537764	Aug 1985	424050000	Pellico et al.
	US 4578265	Mar 1986	424050000	Pellico et al.
	US 4996062	Feb 1991	426008000	Lehtonen et al.
	US 5110609	May 1992	426402000	Lewis et al.
	US 5176899	Jan 1993	424050000	Montgomery
	DE 2520792	Nov 1976	426010000	
	GB 986178	Mar 1965	426404000	

NCL NCLM: 424050000
NCLS: 053403000; 053405000; 053408000; 053432000; 424094400; 426404000; 426486000

IC ICM: A61K007-28

ICS: A61K037-50
EXF 053092000; 053400000; 053405000; 053408000; 424000000; 424094400; 426404000; 426486000
ARTU 125

L13 ANSWER 9 OF 13 WPIDS COPYRIGHT 2001 DERWENT INFORMATION LTD
AN 1989-326272 [45] WPIDS
DNC C1989-144419
TI 5-C-hydroxy methyl-aldo hexose cpds. prepn. - by enzymatic oxidn. with e.g. **galactose oxidase**, followed by condensation with formaldehyde and base.
DC B03 D13 E13
IN HILER, G D; KLUESENER, B W; MAZUR, A W; STIPP, G K
PA (PROC) PROCTER & GAMBLE CO
CYC 8
PI EP 341063 A 19891108 (198945)* EN 14p
DK 8902235 A 19891106 (199003)
FI 8902144 A 19891106 (199006)
AU 8933992 A 19891109 (199008)
JP 02084190 A 19900326 (199018)
US 5104797 A 19920414 (199218) 11p
NZ 228994 A 19921125 (199305) C12P019-02
FI 91069 B 19940131 (199408) C07H015-04
EP 341063 B1 19940316 (199411) EN 20p C12P019-02
DE 68913801 E 19940421 (199417) C12P019-02
PH 26765 A 19920928 (199634) A23L001-09
ADT EP 341063 A EP 1989-304505 19890504; JP 02084190 A JP 1989-113999 19890506; US 5104797 A US 1989-337725 19890417; NZ 228994 A NZ 1989-228994
19890504; FI 91069 B FI 1989-2144 19890504; EP 341063 B1 EP 1989-304505 19890504; DE 68913801 E DE 1989-613801 19890504, EP 1989-304505 19890504; PH 26765 A PH 1989-38609 19890504
FDT FI 91069 B Previous Publ. FI 8902144; DE 68913801 E Based on EP 341063
PRAI US 1988-190485 19880505; US 1989-337725 19890417
REP 2.Jnl.Ref; A3...9036; EP 341062; No-SR.Pub
IC ICM A23L001-09; C07H015-04; C12P019-02
ICS A23L001-23; A23L001-236; C07H001-00; C07H003-10; C07H019-01; C07N001-00; C12N009-04; C12P019-44
AB EP 341063 A UPAB: 19930923
Prepn. comprises (a) reacting under agitation an aq. soln. pref. having pH6-8 and at 1-50 deg.C, comprising (i) 1-50% of at least 1 D-aldohexose based cpd. and (ii) 1,000-1,000,000 unit activity of the enzyme D-aldohexose:oxygen 6-oxidoreductase per mole of D-aldbhexase based cpd., (b) reacting the obtd. soln. with 1-40 mol equivalents of formaldehyde and
1-13 mol equivalents of at least 1 base of NaOH, Ca(OH)2 and KOH, at 15-40
deg.C and pH12-13 and (c) purififying the obtd. aq. 5-C-hydroxymethyl -D-aldohexase based cpd. contg. soln., pref. by dewatering and crystallising the cpd. The condensn. prod. of step (c) is additionally (d) hydrolysed with 1-10 molar equivalents of at least 1 of H2SO4, HNO3, HCl, perchloric acid, phosphoric acid, methanesulphonic acid and trifluoromethane sulphonic acid while maintaining the reaction mixt. at 20
deg.C to boiling, pref. 80-100 deg.C and (e) residual acid is removed from
the reaction mixt, pref. by neutralisation and then pptn.
USE - Derivs. of 5-C-hydroxymethyl-D-hexose cpds. are used as replacement for sugar, esp. in **baked** goods.
0/0
FS CPI
FA AB; DCN
MC CPI: B07-A02; D03-H01A; E07-A02H

L13 ANSWER 10 OF 13 IFIPAT COPYRIGHT 2001 IFI
AN 1536343 IFIPAT;IFIUDB;IFICDB

TI PREPARATION OF ENZYMATICALLY ACTIVE FORMULATION EMBEDDED IN SILICA GEL

INF Klefenz, Heinrich, Hochdorf-Assenheim, DE
Sanner, Axel, Frankenthal, DE
Tschang, Chung-Ji, Frankenthal, DE
Zahn, Wolfgang, Altrip, DE
IN KLEFENZ HEINRICH (DE); SANNER AXEL (DE); TSCHANG CHUNG-JI (DE); ZAHN WOLFGANG (DE)
PAF BASF Aktiengesellschaft, DE
PA BASF AG DE (7016)
EXNAM Lovering, Richard D
AG Keil & Weinkauf

PI US 4461832 19840724 (CITED IN 007 LATER PATENTS)
AI US 1982-376597 19820510
XPD 24 Jul 2001
RLI US 1980-125035 19800227 CONTINUATION ABANDONED
PRAI DE 1979-2911776 19790326
FI US 4461832 19840724
DT UTILITY; EXPIRED
FS CHEMICAL
MRN 004226 MFN: 0596

AB A process for the preparation of an enzymatically active formulation embedded in silica gel, wherein an aqueous mixture of an enzymatically active formulation and a dissolved alkali metal silicate and/or ammonium silicate is suspended in an organic, water-immiscible fluid and then converted to a water-insoluble gel.

CLMN 11

ECLM 1. A PROCESS FOR THE PREPARATION OF AN ENZYMATICALLY ACTIVE FORMULATION EMBEDDED IN SILICA GEL WHICH COMPRISES: SUSPENDING AN AQUEOUS MIXTURE CONSISTING OF AN ENZYMATICALLY ACTIVE FORMULATION AND A DISSOLVED ALKALI METAL SILICATE AND/OR AMMONIUM SILICATE AS DROPLETS IN A STIRRED ORGANIC, WATER-IMMISCIBLE FLUID AND THEN CONVERTING SAID SILICATE TO A WATER-INSOLUBLE GEL.

ACLM 2. A process as claimed in claim 1, wherein the enzymatically active formulation used consists of active cells or cell fragments of microbiological, vegetable, animal or human origin.

3. A process set forth in claim 1, wherein the formation of a suspension is assisted by using a suspending agent.

4. A process as set forth in claim 1, 2 or 3, wherein the gelling is effected by lowering the pH by means of an agent which is soluble in water and in the organic water-immiscible fluid.

5. A process of claim 4 wherein said agent is an organic acid.

6. A process as set forth in claim 1, wherein the gelling is effected in the presence of an inert material.

7. A process as claimed in claim 1, wherein said enzymatically active formulation embody as micro-organisms one of Streptomyces, Arthrobacter or Bacillus microorganisms, or Escherichia coli, Saccharomuces, Curvularia lunata, or Aspergillus ochraceus.

8. A process as claimed in claim 1, wherein the enzymatically active formulation embody of one of trypsin, chymotrypsin, pancreatin, Alpha - and Beta -amylase, ribonucleases, desoxyribonucleases, cellulase, maltase, pectinase, chitinase, pepsin, bromelain, keratinase, amyloglycosidase, lipase, cholinesterase, lecithinase, phosphatase, alginase, asparaginase, glutaminase, urease, lactase, penicillin-amidase, penicillinase, glucose-isomerase, glucose-oxidase, catalase, peroxidase, lipoxidase, xanthin-oxidase, cytochrome-reductase, lactic acid oxidase, aminoacid oxidase, rennin, ficin, subtilisin, tannase, phenol-oxidase, pullulanase, isoamylase, hexokinase, **galactose-oxidase**, diaphorase, aldolase, glycollic acid oxidase, luciferase, aldehyde-oxidase, naringinase, uricase, glutathione-reductase, nitrito-reductase, nitrate-reductase, succinic acid dehydrogenase, catechol-oxidase, Beta -fructosidase, aminoacid acylase and urokinase.

9. A process as claimed in claim 1, wherein said enzymatically active formulation comprises **baker**'s yeast.

10. A process as claimed in claim 1, wherein the embedded enzymatic formulation is immobilized by the embedding therein in said gel.

11. A process for the preparation of an enzymatically active formulation embedded in silica gel which comprises: suspending an aqueous mixture consisting of an enzymatically active formulation, soluble sulfates or phosphates and a dissolved alkali metal silicate and/or ammonium silicate as droplets in a stirred organic, water-immiscible fluid, then converting said silicate to a water-insoluble gel, and thereafter treating the product obtained with a solution of salt of which the cation forms a sparingly soluble sulfate or phosphate.

REP US 2982749 May 1961 526910000X Friedrich et al.
US 3069370 Dec 1962 264004100X Jensen et al.
US 3791987 Feb 1974 264004000X Fanger
US 3948866 Apr 1976 252009000X Pennewiss et al.
US 3954678 May 1976 252062530X Marquisee
US 4011096 Mar 1977 106288000B Sandell
US 4164613 Aug 1979 526201000 Hoene et al.
DE 2625704 Dec 1976
GB 1267685 Mar 1972 435176000

REN Rose et al.: The Condensed Chemical Dictionary, 4th Edition, Reinhold Publ. Corp., 1950, p. 710.

NCL NCLM: 435176000
NCLS: 264004100; 264004300; 424094300; 424094400; 424094500; 424094600; 424094610; 424094630; 424094660; 427213300; 427213320; 435182000; 436527000; 436535000; 436823000; 436826000

IC ICM: C12N011-14
ICS: B01J013-02

EXF 264004100; 264004300; 427213300; 427213320; 435176000

ARTU 223

L13 ANSWER 11 OF 13 GENBANK.RTM. COPYRIGHT 2001

LOCUS (LOC): SCE20 GenBank (R)
GenBank ACC. NO. (GBN): AL136058
CAS REGISTRY NO. (RN): 252838-53-2
SEQUENCE LENGTH (SQL): 33820
MOLECULE TYPE (CI): DNA; linear
DIVISION CODE (CI): Bacteria
DATE (DATE): 7 Jan 2000
DEFINITION (DEF): Streptomyces coelicolor cosmid E20.
KEYWORDS (ST): 2-hydroxyhepta-2,4-diene-1,7-dioate isomerase; amino acid AB; transporter protein integral, membrane component; amino acid AB; transporter protein, ATP-binding component; arr; chb; glycosy; transferase; GntR-family transcriptional regulatory protein; helicase; IclR-family transcriptional regulator; lipoprotein; LysR-family transcriptional regulatory protein; membrane protein; N-acetylglucosamine-6-phosphate deacetylase; oxidoreductase; rifampin ADP-ribosyl transferase; secreted chitin binding protein; secreted endoglucanase; secreted protein; transcriptiona; regulatory protein; transmembrane efflux protein; tRNA Lys
SOURCE: Streptomyces coelicolor A3(2).
ORGANISM (ORGN): Streptomyces coelicolor A3(2)
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces
NUCLEIC ACID COUNT (NA): 4825 a 12217 c 12007 g 4771 t
COMMENT:
Notes:
Streptomyces coelicolor sequencing at The Sanger Centre is funded by the BBSRC and Beowulf Genomics

Details of S. coelicolor sequencing at the Sanger Centre are available on the World Wide Web.
(URL; http://www.sanger.ac.uk/Projects/S_coelicolor/)
CDS are numbered using the following system eg SC7B7.01c. SC (S. coelicolor), 7B7 (cosmid name), .01 (first CDS), c (complementary strand).
The more significant matches with motifs in the PROSITE database are also included but some of these may be fortuitous.
The length in codons is given for each CDS.
Usually the highest scoring match found by fasta -o is given for CDS which show significant similarity to other CDS in the database.
The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon.
Gene prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at http://www.nih.go.jp/
jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream initiation codon.
IMPORTANT: This sequence MAY NOT be the entire insert of the sequenced clone. It may be shorter because we only sequence overlapping sections once, or longer, because we arrange for a small overlap between neighbouring submissions.
Cosmid E20 Overlaps with cosmid E6 on the AseI-E genomic retsriction fragment.

REFERENCE: 1 (bases 1 to 33820)
AUTHOR (AU): Redenbach,M.; Kieser,H.M.; Denapaite,D.; Eichner,A.; Cullum,J.; Kinashi,H.; Hopwood,D.A.
TITLE (TI): A set of ordered cosmids and a detailed genetic and physical map for the 8 Mb Streptomyces coelicolor A3(2)
chromosome
JOURNAL (SO): Mol. Microbiol., 21 (1), 77-96 (1996)
OTHER SOURCE (OS): CA 125:159753

REFERENCE: 2 (bases 1 to 33820)
AUTHOR (AU): Seeger,K.J.; Harris,D.
JOURNAL (SO): Unpublished

REFERENCE: 3 (bases 1 to 33820)
AUTHOR (AU): Thomson,N.R.; Parkhill,J.; Barrell,B.G.; Rajandream,M.A.
TITLE (TI): Direct Submission
JOURNAL (SO): Submitted (07-JAN-2000) Streptomyces coelicolor sequencing project, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. David A.
Hopwood, [3] John Innes Centre, Norwich Research Park, Colney, Norwich, Norfolk NR4 7UH, UK

FEATURES (FEAT):

Feature Key	Location	Qualifier
source	1..33820	/organism="Streptomyces coelicolor A3(2)" /strain="A3(2)" /db-xref="taxon:100226" /clone="cosmid E20"
gene	1..107	/gene="SCE20.01c"
CDS	<1..107	/gene="SCE20.01c" /note="SCE20.01c, unknown, partial CDS, len: 32 aa."

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                                     /codon-start=3
                                     /transl-table=1
                                     /product="hypothetical protein
                                     SCE20.01c."
                                     /protein-id="CAB65557.1"
                                     /db-xref="GI:6689160"
                                     /translation="SAMPSMAVPRGLAVKGAGPM
                                     YRTEKDRHNLPAFG"
gene            118..1047            /gene="SCE20.02"
CDS             118..1047            /gene="SCE20.02"
                                     /note="SCE20.02, probable amino
                                     acid ABC transporter protein,
                                     solute-binding component, len: 309
                                     aa. Similar to several including:
                                     Salmonella typhimurium
                                     SW:ARGT-SALTY(EMBL:V01368)
                                     lysine-arginine-ornithine-binding
                                     periplasmic protein precursor (260
                                     aa), fasta scores opt:  251
                                     z-score: 294.5 E(): 5.1e-09 25.8%
                                     identity in 279 aa overlap and
                                     Rhizobium sp. (strain NGR234)
                                     SW:Y4TE-RHISN(EMBL:AE000098)
                                     probable amino-acid ABC
                                     transporter periplasmic binding
                                     protein Y4TE (300 aa), fasta
                                     scores opt:  599 z-score: 691.7
                                     E(): 3.8e-31 35.4% identity in 297
                                     aa overlap. Contains a Pfam match
                                     to entry PF00497 SBP-bac-3,
                                     Bacterial extracellular
                                     solute-binding proteins, family 3.
                                     Also contains an N-terminal
                                     possible membrane spanning
                                     hydrophobic domain."
                                     /codon-start=1
                                     /transl-table=11
                                     /product="probable amino acid ABC
                                     transporter protein,
                                     solute-binding component."
                                     /protein-id="CAB65558.1"
                                     /db-xref="GI:6689161"
                                     /translation="MAPPHRTPPWGISDQRPRTA
                                     GPTRRSLLAGVAALGALGAAGCSR
                                     VATASDVKGGDLLDRLRAQGVARLGIAGEVPFGY
                                     IDKNGELTGEAPELAKVIFKRLGV
                                     DRVQPVPTEFGSLIPGLASQQFDVVAAGMYINPD
                                     RCQQVIFSDPDYQMLDAYIVRKGN
                                     PLGLHNYRDVVKKKAKFATGTGYAEIAYAVEHGY
                                     KEDDILIVPDQVAGLNAVESGRVD
                                     VFAGTALTVRDVVKKSSKAEATEAFAPLVDGKPH
                                     VDGGGFAFRPDETNLRDAFNVELQ
                                     KLKKSGELLRILKPFGFTQNEMTDLTAKELCGG"
misc-feature    184..993             /gene="SCE20.02"
                                     /note="Pfam match to entry PF00497
                                     SBP-bac-3, Bacterial extracellular
                                     solute-binding proteins, family 3,
                                     score 77.30, E-value 3.2e-19"
gene            1044..1745           /gene="SCE20.03"
CDS             1044..1745           /gene="SCE20.03"
                                     /note="SCE20.03, amino acid ABC
                                     transporter protein, integral
                                     membrane component, len: 233 aa.
                                     Highly similar to many including:
                                     Escherichia coli
                                     SW:GLNP-ECOLI(EMBL:X14180)
```

glutamine transport system permease protein GlnP (219 aa), fasta scores opt: 377 z-score: 445.7 E(): 1.9e-17 27.8% identity in 212 aa overlap and Rhizobium sp. (strain NGR234) SW:Y4TF-RHISN(EMBL:AE000098) probable amino-acid ABC transporter permease protein Y4TF (238 aa), fasta scores opt: 570 z-score: 667.5 E(): 8.5e-30 45.1% identity in 204 aa overlap. Contains a Pfam match to entry PF00528 BPD-transp, Binding-protein-dependent transport systems inner membrane component. Also contains a possible N-terminal signal sequence and possible membrane spanning hydrophobic domains."
/codon-start=1
/transl-table=11
/product="probable amino acid ABC transporter protein, integral membrane component."
/protein-id="CAB65559.1"
/db-xref="GI:6689162"
/translation="MTSGLWELVLQGVWVTVQLL
FFSSLLATAVSFVVGIARSHRLWI
VRFLAGFYTEVFRGTSALVMIFWVFFVLPPAFGW
QLVPMWAGTLALGLTYGAYGSEIV
RGSLAAVDPAQKEGGIALSFTPWQRMKLILLPQA
VPEMIPPFSNLLIELLKGTALVSI
MGMGDLAFSANLVRLALQESAEIYTYVLLIYFVI
AFLLTRVMRGLEKKLKAGVGKAPK
KKTAAVRVPEGSGVS"

misc-feature 1356..1586
/gene="SCE20.03"
/note="Pfam match to entry PF00528 BPD-transp, Binding-protein-dependent transport systems inner membrane component, score 44.30, E-value 2.7e-09"

gene 1742..2392
/gene="SCE20.04"

CDS 1742..2392
/gene="SCE20.04"
/note="SCE20.04, probable amino acid ABC transporter protein, integral membrane component, len: 216 aa. Highly similar to several ABC transporter permeases including: Escherichia coli SW:GLNP-ECOLI(EMBL:X14180) glutamine transport system permease protein GlnP (219 aa), fasta scores opt: 378 z-score: 454.8 E(): 6e-18 33.2% identity in 217 aa overlap and Rhizobium sp. (strain NGR234) SW:Y4TG-RHISN(EMBL:AE000098) probable amino-acid ABC transporter permease protein Y4TG (231 aa), fasta scores opt: 667 z-score: 792.8 E(): 0 47.6% identity in 208 aa overlap. Contains multiple possible membrane spanning hydrophobic

```
                                     domains and a [redacted]m match to entry
                                     PF00528 BPD-tra..sp,
                                     Binding-protein-dependent
                                     transport systems inner membrane
                                     component."
                                     /codon-start=1
                                     /transl-table=11
                                     /product="probable amino acid ABC
                                     transporter protein, integral
                                     membrane component."
                                     /protein-id="CAB65560.1"
                                     /db-xref="GI:6689163"
                                     /translation="MKWDWSAVSDFMPHFWDGLL
                                     VTLQILVLGSLVSFGLGLVWALLM
                                     RVPSRWVTWPVGVVTEFVRNTPLLVQLFFLFYVL
                                     PEWNITFSALTTGVVAIGLHYSTY
                                     TMQVYRAGIEGVPVGQWEAATALNLPMRRTWTAV
                                     ILPQAIRRVTPALGNYVISMLKDT
                                     PLLMAITVLEMLGEARLFSQQNFQFTEPLTVIGV
                                     AFIVISYLASLALRALERRLAH"
misc-feature    2069..2290           /gene="SCE20.04"
                                     /note="Pfam match to entry PF00528
                                     BPD-transp,
                                     Binding-protein-dependent
                                     transport systems inner membrane
                                     component, score 37.50, E-value
                                     3.1e-07"
gene            2382..3167           /gene="SCE20.05"
CDS             2382..3167           /gene="SCE20.05"
                                     /note="SCE20.05, probable amino
                                     acid ABC transporter protein,
                                     ATP-binding component, len: 261
                                     aa. Highly similar to many
                                     ATP-binding transport protein
                                     including: Bacillus
                                     stearothermophilus
                                     SW:GLNQ-BACST(EMBL:M61017)
                                     glutamine transport ATP-binding
                                     protein GLNQ (242 aa), fasta
                                     scores opt:  758 z-score: 851.7
                                     E():0 47.5% identity in 242 aa
                                     overlap and Thermotoga maritima
                                     TR:Q9WZ60(EMBL:AE001734) amino
                                     acid ABC transporter, ATP-binding
                                     protein (242 aa), fasta scores
                                     opt:  829 z-score: 930.4 E(): 0
                                     54.5% identity in 242 aa overlap.
                                     Also similar to several other
                                     Streptomyces coelicolor transport
                                     proteins e.g.
                                     TR:O50495(EMBL:AL020958) glutamate
                                     uptake system ATP-binding protein,
                                     GluA (258 aa), fasta scores opt:
                                     775 z-score: 683.3 E(): 1.1e-32
                                     48.2% identity in 251 aa overlap.
                                     Contains Prosite hits to PS00211
                                     ABC transporters family signature
                                     and PS00017 ATP/GTP-binding site
                                     motif A (P-loop). Also contains a
                                     Pfam match to entry PF00005
                                     ABC-tran, ABC transporter."
                                     /codon-start=1
                                     /transl-table=11
                                     /product="probable amino acid ABC
                                     transporter protein, ATP-binding
                                     component."
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/protein-id="C[redacted]5561.1"
/db-xref="GI:6[redacted]164"
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IRLEQVTKRFGDNTVLDHLDFSVD
AGKHVTLIGPSGSGKTTILRLLMTLLKPDEGTIT
VDGQKLFPATEKERREVRKQIGMV
FQQFNLFPNMSVLRNITEAPVTVLGMPKDEAVER
AKGLLDMVGLADKCDARPAQLSGG
QQQRVAIARALAMRPKVLLLDEVTSALDPELVAG
VLDLLRDIARSTDITMLCVTHEMN
FARDISDQVLMFDSGRVIEAGAPEKIFSEPEHDR
TREFLSAVL"

misc-feature 2538..2561
/gene="SCE20.05"
/note="PS00017 ATP/GTP-binding site motif A (P-loop)"

misc-feature 2580..3080
/gene="SCE20.05"
/note="Pfam match to entry PF00005 ABC-tran, ABC transporter, score 149.60, E-value 5.4e-41"

misc-feature 2850..2894
/gene="SCE20.05"
/note="PS00211 ABC transporters family signature"

gene 3250..4107
/gene="SCE20.06"

CDS 3250..4107
/gene="SCE20.06"
/note="SCE20.06, possible IclR-family transcriptional regulator, len: 285 aa, Almost identical to a gene fragment which, like SCE20.06, is located upstream of the Streptomyces lividans lysT tRNA gene: TR:Q54411(EMBL:X52073) (200 aa), fasta scores opt: 1250 z-score: 1464.9 E():0 99.5% identity in 200 aa overlap. Also similar to Streptomyces coelicolor TR:Q9X9U3(EMBL:AL096823) putative transcriptional regulator (241 aa), fasta scores opt: 597 z-score: 704.2 E(): 7.7e-32 43.2% identity in 236 aa overlap. Contains a Pfam match to entry PF01614 IclR, Bacterial transcriptional regulator with a putative helix-turn-helix motif situated between residues 41..62 (+3.07 SD)."
/codon-start=1
/transl-table=11
/product="putative IclR-family transcriptional regulator."
/protein-id="CAB65562.1"
/db-xref="GI:6689165"
/translation="MRAPKSAQHPLPGSLLAAIV
NAGMHQRAQGETTVALQHKPTAPH
HSTEDALRVLETVARHTSGVTDTEIARESGIGTE
RLTTLLRMLRREAYVEQTADGAYV
TGEALARLGSAQGREQALREKLQRTLEGLRDSVG
AAVYISRYVDGEVSVTQYADSPAA
PRVNEWVDFRVSAHATAVGKSLLTQLDHAGRRDH
LARHRMARLTSRTITSDKLLLSRL
ESQPATVPVLDLQEYAVGTVCAAVPITAGSAVGC
LALSLPVEHAHRLRRAADELNRSA
APVLLSLAI"

misc-feature 3550..4074
/gene="SCE20.06"
/note="Pfam match to entry PF01614

```
                                    IclR, Bacteria[redacted]ranscriptional
                                    regulator,\sco[redacted]21.90, E-value
                                    6e-08"
tRNA        4197..4270              /note="tRNA Lys anticodon CTT"
gene        complement(4316..4921)  /gene="chb"
CDS         complement(4316..4921)  /gene="chb"
                                    /note="SCE20.07c, chb, secreted
                                    chitin binding protein, len: 201
                                    aa. Highly similar to several
                                    including: Streptomyces
                                    olivaceoviridis (Streptomyces
                                    corchorusii)
                                    TR:Q54501(EMBL:X78535) chitin
                                    binding protein precursor Chb1
                                    (201 aa), fasta scores opt: 1185
                                    z-score: 1303.0 E():0 83.7%
                                    identity in 202 aa overlap and
                                    Streptomyces reticuli
                                    TR:O87962(EMBL:Y14315) chitin
                                    binding protein (Chb2) (201 aa),
                                    fasta scores opt: 1161 z-score:
                                    1276.8 E(): 0 79.1% identity in
                                    201 aa overlap. Contains a
                                    possible N-terminal signal
                                    sequence."
                                    /codon-start=1
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                                    protein."
                                    /protein-id="CAB65563.1"
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                                    /translation="MRTRTKLYAAALGMATTGAL
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                                    NGTVGGCGAIQWEPQSVEGPKGFPASGPADGTIC
                                    SAGHGSFAALDSPKQPNGQAWPTT
                                    RVNGGQSYTFRWQFTARHATTDFKYYVTKPGWNQ
                                    NHNLARSDLNLTPFFTVPYGGKQP
                                    PATLSHSGTLPSGLSGHHVILAVWTVHDTGNAFY
                                    ACSDVTF"
gene        complement(5042..6193)  /gene="SCE20.08c"
CDS         complement(5042..6193)  /gene="SCE20.08c"
                                    /note="SCE20.08c, possible
                                    membrane protein, len: 383 aa.
                                    Contains possible membrane
                                    spanning hydrophobic domains."
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                                    /transl-table=11
                                    /product="putative membrane
                                    protein"
                                    /protein-id="CAB65564.1"
                                    /db-xref="GI:6689167"
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                                    RPVAARPRPAPQVDPELTERPGRV
                                    LPGAAGVAAGLCGAAGCAATSWWAGLVPPLAAQA
                                    LGLPAYAGAGLGPAQWAAYAAAGA
                                    LGMFGFGGLARGRTGRAWVLGLFGRYRGTVRRTG
                                    LMWVNPLLLRRRVDVRLRHWRSEP
                                    MPAADGNGVALRAVTLVVWRVRDTAKATLGVEDH
                                    ETYLRECVEAALARVPVEPLGTVR
                                    SSADVAGDTLTRLVAADAAPVGLEVFSVRPVRVE
                                    YAPEVAAAMHRRRIAALDAAQRAS
                                    VLTSVVDSVEDTVTRLTMRGLVELDDYERKVLVK
                                    DLTVAFCAGRGDTGH"
gene        complement(6250..7311)  /gene="SCE20.09c"
```

CDS [redacted]nt(6250..7311) /gene="SCE20.[redacted]
/note="SCE20.0[redacted], possible membrane protein, len: 353 aa. Contains a possible membrane spanning hydrophobic domain and is rich in the amino acid Ala."
/codon-start=1
/transl-table=11
/product="putative membrane protein."
/protein-id="CAB65565.1"
/db-xref="GI:6689168"
/translation="METPVFEEIEPASDCDCAGC
RHWRRVLPHAPAGRALAHPAAYRT
LVAAAAAASATAVSVLGAGGAAALPAAAHAAHRP
GVPAGDEPGTPQGPRGPLHGPVGR
PAAPPAGAELAGITRTEIIDRAKSWVAAKVPYSL
TAYWSDGYRQDCSGFVSMAWKLPA
NEWTGSLGTVADRITKEELQPGDILLFHNESDPQ
KGSHVVIFGG

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L13 ANSWER 12 OF 13 FROSTI COPYRIGHT 2001 LFRA
AN 489211 FROSTI
TI A composition comprising an enzyme having **galactose oxidase** activity and use thereof.
IN Rouau X.; Schroder M.; Soe J.B.
PA Danisco A/S
SO PCT Patent Application
PI WO 9903351 A1
AI 19980716
PRAI Denmark 19970718
United States 19970722
DT Patent
LA English
SL English

=> d 12 ab,bib

L13 ANSWER 12 OF 13 FROSTI COPYRIGHT 2001 LFRA
AB A composition for **dough** and bread improvement is disclosed. It incorporates an enzyme with **galactose oxidase** activity and an oxidizable substrate for this enzyme. It is said to improve the rheological properties of flour **doughs** and the quality characteristics of bread products. Desirable quality characteristics include soft crumb structure, high specific volume, and freedom from staling within the expected shelf-life of fresh bread. **Galactose oxidase** acts as an oxidoreductase, and its use overcomes problems associated with use of cellulases or **hemicellulases** in flour **doughs**. Because the natural **galactose** content of cereal flours is very low, it is beneficial to include an oxidizable substrate in the formulation.
AN 489211 FROSTI
TI A composition comprising an enzyme having **galactose oxidase** activity and use thereof.
IN Rouau X.; Schroder M.; Soe J.B.
PA Danisco A/S
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United States 70722
DT Patent
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L13 ANSWER 13 OF 13 FROSTI COPYRIGHT 2001 LFRA
AB A composition for **dough** and bread improvement is disclosed. It incorporates an enzyme with **galactose oxidase** activity and an oxidizable substrate for this enzyme. It is said to improve the rheological properties of flour **doughs** and the quality characteristics of bread products. Desirable quality characteristics include soft crumb structure, high specific volume, and freedom from staling within the expected shelf-life of fresh bread. **Galactose oxidase** acts as an oxidoreductase, and its use overcomes problems associated with use of cellulases or **hemicellulases** in flour **doughs**. Because the natural **galactose** content of cereal flours is very low, it is beneficial to include an oxidizable substrate in the formulation.
AN 526332 FROSTI
TI A composition comprising an enzyme having **galactose oxidase** activity and use thereof.
IN Rouau X.; Schroder M.; Soe J.B.
PA Danisco A/S
SO European Patent Application
PI EP 999752 A1
WO 9903351 19990128
AI 19980716
PRAI Denmark 19970718
United States 19970722
DT Patent
LA English
SL English